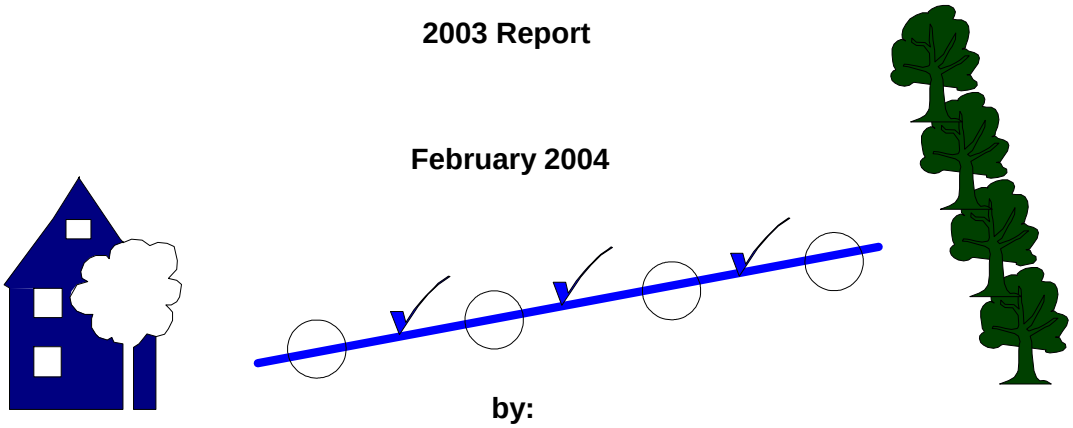
Colorado River Salinity Control Program

McElmo Creek Unit

Monitoring And Evaluation

2003 Report

February 2004



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McElmo Creek Unit, Colorado River Salinity Control Program

M&E EXECUTIVE SUMMARY
HYDROSALINITY

Project: __McELmo Creek Unit_

- The project plan is to treat 21,550_acres with improved irrigation systems.
- To date, _8,169__acres have improved irrigation systems.
- The project plan is to reduce salt loading to the Colorado River system by _46,400___ tons of salt.
- In FY2003, salt loading has been reduced by _1,392_tons/year.
- The cumulative salt load reduction is _20,199_ tons/year.

Cost effectiveness-

- The *planned* cost per ton of salt saved with prior year contracts is $_36.70_/ton.
  $/Ton is based on the following formula:

  FA + TA= Total Cost X Amortization Factor= Total amortized cost
  Total amortized cost divided by total annual tons salt saved= Cost/Ton

  FA is total dollars obligated in EQIP & Parallel Program (including wildlife).
  TA is 67% of the FA (This number includes education and monitoring).
  Amortization factor for 2001 is .081

M&E EXECUTIVE SUMMARY
ECONOMIC & SOCIAL

CONTRACT INACTIVITY

- During the past fiscal year, were there any contracts found in non-compliance, or were there any cancelled contracts that had remaining items to complete.
  Yes No

- If yes, indicate the level of significance or insignificance: ***Insignificant in relation to the whole program.***
- _____

OTHER PROGRAM BENEFITS

- Considering changes in crop production costs and returns as a result of the salinity practices, has there been a:
  Positive effect No effect Negative effect

  Explain: ***_Many participants have told of increased crop production on the same acreage due to increased irrigation efficiency. _Of the 20 participants polled, 10 realized a substantial gain. Ten realized at least a minimal economic gain.***

  _____
  _____

- Is there information collected that indicates effect of program on economic and environmental benefits to the community?
  Yes No

  Explain: ***__Of the 20 participants polled all think that the program has a substantial positive affect on the environment and economic conditions to the community. Specific comments range from "the best program in the government" to " I wish all programs were as effective."***

  _____
  _____

M&E EXECUTIVE SUMMARY FOR "OTHER RELATED ITEMS"

- **IRRIGATION INDUCED EROSION-** Does the project award ranking points for control of irrigation induced erosion?
  Yes No

- **IRRIGATION WATER MANAGEMENT PROGRAM-** Is there an effective funded education program?
  Yes No

  Briefly Explain: ***_NRCS field office conducted 2 successful workshops concerning methods of determining timing of irrigation events.***

  _____

M&E EXECUTIVE SUMMARY- McElmo WILDLIFE

HEP/HSI Data involving accomplishments made by I-EQIP, EQIP, and parallel program 1996-2003

Species	Cumulative HUV's 2002	Cumulative HUV's 2003	Net Change for 2003
	(Applied)	(Applied)	
Pheasant	-2395.32	-2361.84	+33.48
Mallard Winter	+83.61	+96.22	+12.61
Mallard Breeding	-3261.49	-3266.76	- 5.27
Yellow Warbler	-50.92	-51.85	- .93
Meadow Vole	-686.65	-685.98	+ .67
Marsh Wren	-12.20	-23.15	+10.95
Screech Owl	-2145.00	-2131.80	+13.20
Snipe	-237.38	-239.53	- 2.15
Total			

Acres of Wildlife Habitat Applied 1990-2003

	Cumulative acres 2002	Cumulative acres 2003	Net change for 2003
Upland	**297.60**	**302.60**	**+ 5.0**
Wetland	**326.90**	**326.90**	**+ 0.0**

Wetland Data 1990-2003

Cumulative acres impacted year 2002	Cumulative acres impacted year 2003	Net AREM Unit change 2002	Net AREM Unit change 2003	Net change for 2003
128.49	**128.49**	**0.00**	**0.00**	**0.00**

Funding for Wildlife Habitat 1990-2003

% of total funds spent on wildlife through 2002	% of total funds spent on wildlife through 2003
1.4%	**1.5%**

Explanation of the above results and planned wildlife program adjustments for next fiscal year: **Losses of habitat declined in 2003. This may be attributed to the smaller acreage land units we are presently working. It may also be a reflection of the type of projects (pipelines rather than on-farm improvements) we are working on and the percentage of wildlife plans (25%) vs. non-wildlife plans for the year. No wetland losses were documented for the year also. We do have one new contract which encompasses 35 acres of mixed riparian, wetland and upland habitat connecting two existing wildlife management units.**

There still appears to be a problem with the Mallard Breeding HUV figures. On contracts applied prior to 1997 we showed a net gain in HUVs. For some reason the statistics are still showing negative numbers. We have not changed our planning and implementation strategies to the extent that we should be seeing these losses which appear to be grossly out of proportion for the area we are working in.

The fact that we are prioritizing good habitat improvement applications is helping our replacement efforts. These applications are selected off the top of our list. The intent is to capture the best opportunities for habitat benefits in order to catch up with losses over the past 12 years of the program. This may also be escalated with offsite improvement opportunities as the program allows.

Monitoring and Evaluation Report
Montezuma County Unit
Colorado River Salinity Control Project
2003

USDA-NRCS

Daniel F. Champion, USDA-NRCS, EQIP Salinity Control Units
Michael Rich, USDA-NRCS Soil Conservationist, Cortez, Colorado

Hydrosalinity Monitoring and Evaluation

In the year 2003, USDA-NRCS conducted monitoring irrigations for USDA-NRCS under the EQIP program. Equipment was set out at 2 sites in the Cortez study area in Southwestern Colorado. Applied irrigation water to these fields was measured so that deep percolation of irrigation water could be determined.

A meeting was held ascertain the direction that the program should take with respect to satisfying the objectives of the hydrosalinity monitoring and education. It was decided to monitor 2 sites in the Grand Valley area (Mesa County), 4 sites in the Lower Gunnison area (Montrose and Delta Counties), and 2 sites in the Cortez (Montezuma County) area.

The 2003 irrigation season was characterized by unusually hot, dry windy weather, much like the 2001 season and the beginning of the 2002 season. This led to the high evapotranspiration rates throughout the entire season. The snowpack was reduced in a short period of time by the extreme weather conditions

Telephone calls were received from cooperators regarding irrigation questions. Responses were either resolved by one-on-one contacts with the irrigators or by appropriate referrals to other agencies.

The EQIP assisted irrigators appear to be using their structures and irrigation equipment efficiently, and the data suggests that this program is effective in assisting producers to reduce deep percolation losses of irrigation water and hence, salt loading of the Colorado River.

Several educational programs were undertaken to either present data from the monitoring program or to inform irrigators of proper irrigation methods and procedures.

MONTEZUMA COUNTY IRRIGATION MONITORING
2003
USDA-NRCS

Introduction

The Natural Resources Conservation Service (NRCS) has been placing improved irrigation methodology with selected cost-sharing cooperators for a number of years through the Colorado River Salinity Control Program. Irrigations of several cooperators were monitored with flow measuring equipment to evaluate the effectiveness of the equipment to reduce deep percolation of irrigation water. However, due to reductions in force as a result of budget restrictions, the monitoring efforts by the NRCS were forestalled.

Several entities led by the Salinity Forum requested that the monitoring of selected irrigations in the Lower Gunnison, Montezuma County and Grand Valley Salinity Control units be resumed. Therefore, with monies derived from the Environmental Quality Incentive Program (EQIP) from the three salinity control units, we conducted the monitoring of irrigations in the three units. This is the second year that the Cortez area irrigations have been monitored by this office with valuable cooperation from the Cortez field office.

The original monitoring plan required that separate irrigation sites be monitored throughout the irrigation season to assess the effectiveness of the improved irrigation systems and irrigation management in reducing deep percolation of irrigation water which contributes salt to the Colorado River system via a loading process.

Methods

A list of possible cooperator irrigators from the Montezuma County (Cortez area) unit was supplied by the NRCS so that fields could be evaluated for monitoring suitability. This was accomplished and letters were drafted to the selected cooperators to stipulate the terms of monitoring. The selected cooperators agreed to remain in contact with the local NRCS office so that proper measuring equipment could be installed.

Soil samples were taken shortly before any irrigations so that the antecedent soil moisture could be determined. This established the soil moisture deficit that had to be satisfied to fill the soil profile by an irrigation. Subsequent soil moisture deficits were determined by calculating the evapotranspiration (ET) of the crops in the fields and subtracting the crop water use data from the pre-existing soil moisture. Any excess water applied over and above the crop water needs was considered to be lost to deep percolation. No consideration was given to leaching requirements to keep soil salinity at desirable levels.

Irrigation in the Cortez-Montezuma-Dolores Counties area is characterized by side-roll move sprinklers on gently rolling wind-blown loess soils. The intake rates of the soils are generally medium to high. Previous irrigation was by very inefficient surface flow over the same soils. By converting the surface flow irrigation to side-roll irrigation, the efficiencies were greatly increased and, hence the deep percolation losses of water were greatly lessened. Approximately 85% of the agricultural land is irrigated by the side-roll sprinklers.

Flow meters were installed at both locations selected for the monitoring. The meters were read on a regular basis to insure that the water was being applied in an efficient manner.

This office frequently fields inquiries from irrigators, many of them new to the area and thus to irrigation, concerning the proper method of irrigation to be used. We worked with a few of these irrigators to assist them in the art of proper irrigation, which resulted in greatly decreased deep percolation losses of their irrigation water. Without this assistance, it is possible that these irrigators could conceivably negate the positive effects of the EQIP irrigations on an acre to acre comparison.

In addition, we participated in several educational aspects of irrigation in a sponsored workshop conducted by Colorado State University. The NRCS personnel in the Cortez Field Office sponsored a very successful workshop regarding irrigation timing determinations.

Results

Equipment was set out in the field to monitor irrigations on 2 different sites in the Cortez monitoring area. The first site (site 1) was west of the city of Cortez and is about 62 acres in size. The producer rotates his water every 24 hours and applies about 4.5" per 24 hour set. The second site (site 2) is southwest of Cortez and is comprised of about 40 acres. Both are planted to established alfalfa-grass mix for hay. Sixteen irrigations yielded useable data. It is possible that more irrigations would have taken place, but water availability was limited by the on-going drought.
The application amounts and deep percolation amounts of irrigation water are presented in terms of acre-feet per acre at the end of the report. There are no deep percolation losses of irrigation water at either of the 2 sites for any of the irrigations due to several factors:

1. Water available for irrigation was somewhat limiting.

2. Soil moisture depletion was accelerated by the intense evaporanspiration (ET) values brought on by the hot, dry windy weather.

3. The 2 irrigators managed their available water very judiciously and applied it with the utmost in management considerations.

4. The irrigation side-roll systems lend themselves to efficient irrigation water applications.

It was not uncommon to see daily reference alfalfa ET rates in excess of 0.35" throughout the irrigation season. This depleted the soil moisture rather rapidly, and the applied irrigation water never really caught up to the depletion. However, the season ended with an immense rainstorm which brought the soil moisture back to almost normal. Also, about 2" of rain fell on 8/23. We assumed that the intake from the storms which totaled over 5.0" of moisture was 50% efficient. Soil tests should be taken at the beginning of the next irrigation season to determine the beginning soil moisture depletion.

We have considered deep percolation to be the primary indicator of the effectiveness of the irrigation application; others may be concerned with the efficiencies of the irrigation. Since the deep percolation losses of water are the main contributor of salt loading to the river system, that figure holds our greatest interest. Since there were either no deep percolation or runoff losses of applied irrigation water, the efficiencies of the irrigation are of no consequence.

In addition to monitoring irrigations of the aforementioned EQIP cooperators, we responded to 3 telephone calls from irrigators in the Cortez unit. Generally, we were either able to assist these people in improving their irrigation procedures or to steer them to the proper NRCS personnel in the Cortez Field Office. Mr. Michael Rich, Soil Conservationist, is invaluable for his knowledge of the area. It was obvious when accompanying him to the field, that the producers of the area respect him for his ability and experience.

Both cooperators wish to remain anonymous in this report.

Educational Activities

We participated in several educational activities in the Cortez area.

The NRCS field office conducted successful workshops concerning the timing of irrigation events.

Conclusions

1. No deep percolation losses of applied irrigation water were observed, due in part to several factors:

    a. Irrigation water was limiting
    b. The improved systems are effective in enabling producers to apply irrigation water efficiently
    c. The hot, dry weather produced large soil moisture deficits which were hard to fill with the limited water
    d. The irrigators used their available water very judiciously

2. The antecedent soil moisture and management considerations appear to be the major factors in governing deep percolation of irrigation water.

Recommendations for Future Monitoring

1. Monitoring of irrigation events should be discontinued and efforts geared toward irrigation water management with selected producers.

2. Although urbanization of agricultural land is proceeding more slowly in the Montezuma County area than in the Lower Gunnison and Grand Valley salinity control areas, it may become a significant contributor to deep percolation losses and hence, salt loading to the river. A study of the effects of conversion of agricultural land to urban-suburban use on changes in water consumption should be conducted in a scientific manner accompanied by some educational aspects.

Additional

Much of the information reported herein will be presented at several workshops to interested producers.

APPENDICES

Site 1. ----------Acre-feet/acre---------- hours

Irrigation Dates	Soil Moisture Deficit	Irrigation Amount	Infiltration	Deep Percolation	Time	
5/5	0.33	0.38	0.38	0.05	24	
5/27	0.29	0.38	0.38	0.09	24	
6/29	0.50	0.38	0.38	<0.12>		24
7/21	0.61	0.38	0.38	<0.27>		24
8/22	0.41	0.38	0.38	<0.03>		24
9/13	0.19	0.38	0.38	0.19	24	

Significant rainfall: 8/23, ~2"
9/09, ~3"

<> denotes deficit irrigation

Site 2.

	----------Acre-feet/acre----------			Hours
Irrigation Dates	Soil Moisture Deficit	Irrigation Amount	Infiltration	Deep Percolation	Time
5/7	0.28	0.20	0.20	<0.08>	12
5/21	0.25	0.20	0.20	<0.05>	12
6/4	0.32	0.20	0.20	<0.12>	12
6/18	0.33	0.20	0.20	<0.13>	12
6/25	0.30	0.20	0.20	<0.10>	12
7/9	0.37	0.20	0.20	<0.17>	12
7/23	0.36	0.20	0.20	<0.16>	12
8/6	0.27	0.20	0.20	<0.07>	12
8/27	0.24	0.20	0.20	<0.04>	12
9/13	0.19	0.20	0.20	0.03	12

Significant rainfall: 8/23,~2"
9/09,~3"

- ♦ denotes deficit irrigation

M&E REPORT, WILDLIFE

I. History and Background

A. Project Setting

The McElmo Creek Unit, known locally as the Montezuma Valley, is in the southwest corner of Colorado within Montezuma County. The City of Cortez, centrally located in the project area, is at an elevation of 6200 feet above mean sea level. The McElmo Creek watershed originates in the lower foothills of the LaPlata Mountains to the East. Its north boundary is the Dolores River Canyon Rim and the South by Mesa Verde and the Ute Mountain to the Southwest. McElmo Creek is a tributary to the San Juan River.

The McElmo Creek basin, having a limited watershed area, is a relatively dry basin under natural conditions. Montezuma Valley Irrigation Company (MVIC), the major user and distributor of irrigation water, diverts approximately 116,000 acre feet of Dolores River water annually (1957-1973 data) into the Montezuma Valley. Diverting water from McPhee reservoir on the Dolores River through a tunnel and extensive canal system, MVIC presently distributes water to approximately 29,000 acres. Return flows from irrigation and municipal discharges constitute most of the continuous channel flow in McElmo creek.

Mancos Shale underlies much of the Montezuma Valley. This shale is of marine origin with a high salt content, and provides the main salt source for the return flow into McElmo Creek. Excessive irrigation and seepage from delivery systems cause deep percolation. This water dissolves salts, which move downward until they reach McElmo Creek, then the San Juan River, and finally the Colorado River**.**

The farmland elevation ranges from 5,800 to 7,000 feet. The annual precipitation is nearly 12 inches, including snowfall.

B. Methods of Wildlife/Habitat Analysis for EIS

The Habitat Evaluation Procedures (HEP) were used on six alternative plans including future without. An interagency team determined the change of Habitat Unit Values (HUV) for all the alternatives. Eight wildlife species models were used, representative of the ten prevalent cover types in the study area (see list below).

SPECIES

- marsh wren
- mallard-winter
- mallard-breeding
- ring-necked pheasant
- great-horned owl
- yellow warbler
- meadow vole
- common snipe.

COVERTYPES

- Cropland (AC)
- Annual Herbland (ANNHERB)
- Perennial Herbland (PERHERB)
- Woodland (WOODY)
- Pasture and Hayland (AP)
- Native Rangeland (SSSB)
- Orchards and Vineyards (AO)
- Palustrine Emergent Wetlands (PEM)
- Streams, Rivers and Canals (RIVERSn)
- Lakes, Ponds and Reservoirs (LAKESn)

NRCS also conducted a wetland inventory between 1979 and 1980. These wetlands were mapped, classified according to Circular 39 and the Cowardin System for Classification of Wetlands and Deepwater Habitats, and given a wildlife value rating using a system developed by Francis Golet (which gives wetlands a numerical value). This system rates factors such as water regime, wetland class richness, size and juxtaposition.

C. EIS Conclusions

Mitigation is a mechanism for addressing adverse project impacts on fish and wildlife resources. It can be accomplished by reducing, avoiding, rectifying or compensating adverse impacts. The Colorado River Basin Salinity Control Act, Public Law 93-320 as amended by PL 98-569: 88 Stat. 266, does not contain the word "mitigation". It does provide for the "…voluntary replacement of incidental fish and wildlife values foregone;" NRCS developed wetland policy (7CFR 650.26) in compliance with N.E.P.A. Executive Order 11990. This policy was written to allow for certain policy exceptions to meet NRCS water quality and water conservations objectives. NRCS will make every effort to work with customers to voluntarily replace wildlife habitat using approved wildlife practices under the program.

D. EIS Commitments

NRCS will attempt to voluntarily obtain both upland and wetland habitat replacement with landowners participating in the program. No set upland acres impacted were specified in the EIS. The reason for this was that it was thought that changes to upland habitats were more subtle and less destructive to overall wildlife species composition and population densities. One upland cover type replacing another would not necessarily displace the species of concern. Changes in cultural practices or practice intensity would be of more concern. Upland habitat impacts would be tracked and replacement achieved as opportunities arise.

NRCS will install 310 acres of wetland habitat development. According to the recommended plan this will provide equivalent wetland values to those found in the 615 acres of wetlands projected to be lost.

Other agencies or entities, such as the Colorado Division of Wildlife, US Fish & Wildlife Service, Ducks Unlimited, etc., will be given the opportunity to assist with planning replacement practices, reviewing NRCS replacement efforts and evaluating practice effectiveness.

E. Changes Since EIS Was Issued

Since the EIS was issued there have been programmatic changes, staff changes and methodology changes within the program. Programmatic changes include the implementation of the Environmental Quality Incentives Program (EQIP) which has replaced the CRBSCP. For the most part, the program has mimicked the old Salinity program. Another programmatic change has been the implementation of the Basin Program which parallels the EQIP salinity program. This program is funded by the US Bureau of Reclamation with money distributed through the local Soil Conservation Districts. Staffing since the early days of the salinity program has been reduced substantially. This has distributed all planning and follow-up responsibilities evenly throughout a smaller staff, leaving less time for tracking and monitoring activities. Methodology changes have included the use of the Avian Richness Evaluation Method (AREM), developed for the study area by Paul Adamus, for tracking wetland quality changes and the development of a statistical analysis of the HEP data collected from 1990 to 1997 in order to project HSI's and estimate project impacts. All planned wildlife practices since 1997 are tracked by year, contract, and dollars for practices obligated and applied, as well as extent of practices planned and applied.

II. Current Methods

A. Assessments/Evaluation

AVIAN RICHNESS EVALUATION PROCEDURES (AREM)

Paul R. Adamus developed this evaluation method in cooperation with the Environmental Protection Agency for use in the "lowland wetlands of the Colorado Plateau" (specifically the Salinity Control Units in Utah, Colorado and Wyoming).

In 1994 the State of Colorado Natural Resources Conservation Service decided to adopt AREM for evaluating wetland impacts in the McElmo Creek, Lower Gunnison and Grand Valley salinity control units.

Evaluation of all McElmo Creek salinity contracts used this method.

Values were obtained by averaging the "six habitat scores weighted by species," multiplied by .01, and then multiplied by the acres to obtain unit values. Approximately 103.8 net wetland acres of the 615 acres projected in the EIS have been lost. Through creation of new and enhancement of existing wetlands we have perceived a net gain of 22.4 value points.

HABITAT EVALUATION PROCEDURES (HEP)

Since 1997, we have discontinued wildlife tracking and monitoring measures as outlined for the salinity program. In 1999, due to increased workloads and a 75% reduction in staff, we chose to track cost-share, acres and wildlife practices for EQIP salinity. A statistical analysis of HEP data (collected through 1998) was conducted to determine adequate sample size needed to calculate mean habitat suitability indices (HSI) with 95% confidence. The calculated mean is within + or -.1 of the real mean. Data from 1999 and 2001 was also collected, desired sample sizes were achieved, and mean HSI values calculated for each wildlife species (for contracts with and without wildlife practices). Habitat Unit Values (HUV's) were then calculated by multiplying HSI's by HUV's, to estimate project impacts. Tables 6 and 7 show the 1996-2002 tracking results as outlined above.

B. Wildlife Practices

Wildlife practices implemented to improve or develop upland and wetland wildlife habitat have changed over the years, mainly to reflect certain constraints and NRCS priorities (as well as those of the various agencies charged with oversight). We have eliminated the practice of pothole blasting in wetlands due to the continued encroachment of dwellings and the limited effectiveness. Pond construction has been limited by the Division of Water Resources permitting process and the limited values achieved by the practice. If shallow water is designed into the practice it becomes more effective. But the permitting process also limits shallow water construction. Management practices such as rotational grazing, setting aside alfalfa for nesting and small grain for food are not popular practices in the area.

The following practices are used effectively within the study area:

- Grass/legume cover plantings for upland nesting and roosting
- Shallow water developments for waterfowl and shorebird feeding and resting
- Tree and shrub plantings for upland wildlife nesting, roosting and food
- Fencing to exclude livestock grazing either permanently or during critical use periods
- Bioengineering practices to improve or protect riparian habitat
- Occasional development of irrigation to improve forage quality for wildlife

III. Results

A. Impacts

The following tables summarize the data tracked from one hundred and three (1990 through 1996) contracts. For the most part, all contracts have been applied and these figures represent our best assessment of impacts. In many cases projections of cover type changes (planned condition) have been substantially altered since 1990 due to changes in cooperator priority. Over the past 10 years, 50 out of 71 contracts with wildlife have either had the wildlife portion eliminated or the whole contract cancelled. This is evident in the applied replacement summary that follows.

Table 1

1990-1996 Wetland Impacts (Acres/Values)

Type	Existing		Applied		Change	
	Acres	Value	Acres	Value	Acres	Value
1	5.08	0.84	2.30	.54	-2.78	-.30
2	203.76	82.60	112.7	76.41	-91.10	-6.20
3	106.3	47.94	106.9	72.81	+.57	+24.87
4	10.80	5.95	9.30	7.95	-1.50	+.20
5	10.40	8.35	28.50	16.19	+10.10	+7.84
6	46.85	19.68	41.49	19.48	- 5.36	-.20
9	24.20	4.73	11.20	.87	-13.70	-3.86

(Wetland Summary—Applied Changes)

AVIAN RICHNESS EVALUATION PROCEDURES (AREM)

Paul R. Adamus developed this evaluation method in cooperation with the Environmental Protection Agency for use in the "lowland wetlands of the Colorado Plateau" (specifically the Salinity Control Units in Utah, Colorado and Wyoming).

In 1994 the State of Colorado Natural Resources Conservation Service decided to adopt AREM for evaluating wetland impacts in the McElmo Creek, Lower Gunnison and Grand Valley salinity control units.

Evaluation of all McElmo Creek salinity contracts used this method.

Values were obtained by averaging the "six habitat scores weighted by species," multiplied by .01, and then multiplied by the acres to obtain unit values. Approximately 114.44 net wetland acres of the 615 acres projected in the EIS have been lost. Through creation of new and enhancement of existing wetlands we have perceived a net gain of 22.4 value points.

Table 2

1990-1996 Cover Type Changes (Acres)

Cover	Exist	Apply	Change
AC	.00	109.97	+109.97
ANNHERB	327.90	189.70	-138.20
AP	2963.50	3118.3	+154.80
LAKESn	25.80	37.10	+11.30
PEM	375.20	259.60	-115.60
PERHERB	146.50	198.20	+51.70
SSSB	172.60	115.3	-57.30
WOODY	299.40	275.90	-23.50
AO	12.30	9.70	- 2.60

(Cover Type Summary—Applied Condition)

This report reflects where cover type changes occurred within 103 operating units. Its value is questionable as land has not remained constant (acres of farmland cover type change annually).

The cropland (AC) designation applies to annual row crops such as corn, barley, wheat or oats. The only grain or corn grown under surface irrigation in 1990 was small acres of either oats as a nurse crop for alfalfa or silage corn. Since that time sprinklers have allowed producers to incorporate 1 to 2 years of wheat, oats, or barley into their rotation. ANNHERB (weeds) figures have decreased mainly on farms where fields were idle during initial evaluation. The pasture and hay land (AP) figures have inversely increased over time as the means of irrigation changed, allowing greater irrigation efficiency and cost effectiveness in alfalfa production.

The increase in perennial cover (PERHERB) acreage reflects several larger plantings, which have been incorporated into some of the larger wildlife contracts.

Table 3
1990-1996 HUV Summary (Values)

Species	Existing	Applied	Change
Pheasant	3585.50	3484.70	- 99.80
Warbler	51.33	43.21	- 8.12
Mallard Breeding	4074.00	4552.40	+478.40
Mallard Winter	6.6	97.75	+ 91.15
Vole	873.40	866.93	- 6.47
Wren	101.73	143.75	+ 42.02
Owl	3235.43	2956.68	- 278.75
Snipe	326.33	259.43	- 66.90

HUV Summary—(Applied Condition)

PHEASANT:	Reflects intensive pasture and hay land management and loss of perennial cover along ditch banks and fence lines due to installation of sprinkler systems and buried pipe.
WARBLER:	Reflects loss of ditch bank associated willow habitat due to installation of buried pipe.
MALLARD BREEDING:	Reflects increases in acres of managed wetlands in association with increased acres of shallow water development.
MALLARD WINTER:	Reflects increase in acres of large ponds that may stay fully or partially open in winter and increased availability of waste grain associated with cropland.
MEADOW VOLE:	Reflects more intensive management of pasture and hay land.
WREN:	Reflects the enhancement, creation, and protection of cattail/bulrush habitat in several large wetland development and enhancement projects.
OWL:	Reflects the loss of mature cottonwoods and a decrease in cover type diversity adjacent to remaining nesting sites.
SNIPE:	Reflects a change in the suitability of types 1 and 2 wetlands as well as the losses of these wetland types due to increased water management activities.

B. Applied Practices (1990-1996)

- Cover plantings encompass perennial herbaceous grass/forb plantings in upland sites that were once cropland (either irrigated or non-irrigated).

- Fencing was done to exclude livestock grazing (either permanently or during critical wildlife use periods) from all cover types, but especially wetland habitat.

- Pipelines and sprinklers were installed on dry land or abandoned irrigated fields in order to produce denser cover for upland bird nesting or roosting, and higher quality forage for big game.

- Trees and shrubs were planted in rows and clumps to provide food, nesting and roosting cover for upland birds. Some plantings were also installed to provide browse for big game.

- Shallow water development includes ponds and potholes. Most pond designs incorporated both deep and shallow water. Potholes were blasted in existing palustrine emergent wetlands with little or no open water.

- Wetland and upland wildlife habitat management was dependant on landowners priorities. To be qualified and quantified as management, landowners need to adhere to NRCS management guidelines for the practices in place, the habitat type, the species of concern and the critical use period(s) of that species.

Table 4

(Replacement Summary-Applied 1990-1996)

Practices	Planned	Applied
Cover Plantings	74.9 ac	36.68 ac
Fencing	85,465 ft	53,785 ft
Pipelines	538 ft	507 ft
Tree/shrub Plantings	18.22 ac	8.86 ac
Sprinklers	240 ft	160 ft
Wildlife Upland Habitat Management	277.84 ac	152.9 ac
Shallow Water Development	18.43 ac	15.94 ac
Potholes	42	25
Wildlife Wetland Habitat Management	294.74 ac	297.3ac

C. EQIP Program Summary by Year: Since 1997, we have discontinued wildlife tracking and monitoring measures as outlined for the salinity program. Currently we are tracking cost-share, acres and wildlife practices planned and applied. WHIP planning efforts within the priority unit are also recorded.

Table 5
(Interim EQIP, WHIP, Basin & EQIP Wildlife Habitat Planned & Applied)

1996-2002 PROGRAM YEARS	$ COST	$ WL SHARE	WET ACRES	UPLAND ACRES	ft. fence	ac. cover plantings	Ft. Shrub Plantings	ft. pipe lines	no. ponds	ac. grazing mgt.	ac. upland mgt.	ac. wetland mgt.
14 Contracts	2219.0 ac.											
1996-Planned	511,020	2,097	11.6	0.2	1650		800			11.8	0.2	11.6
1996-Applied	NA	692	NA	NA	420		380			.2	.2	0
3 with wildlife												
22 Contracts	724.7 ac.											
1997-Planned	219,435	4,551	2.3	27.6	2300		1600		4	10	27.6	2.3
1997-Applied	NA	3,604	NA	NA	2238		2800		2	10	17.6	1.8
2 with wildlife												
16 Contracts	471.0 ac.											
1998-Planned	135,607	16,652	4.3	16.4	4080	16	2850		3	1.6	16.4	4.3
1998-Applied	NA	6,461	NA	NA	0	0	0	261	3	0	0	4.3
5 with wildlife												
31 Contracts	626.8 ac.											
1999-Planned	341,501	16,258	2	27.9		27.8	3600	3300	2	28	28	2
1999-Applied	NA	9,160	NA	NA		27.25	3600	2882	2	28	28	2
2 with wildlife												

(Interim EQIP, Basin & EQIP Wildlife Habitat Planned & Applied cont…..)

1996-2002 PROGRAM YEARS	$ COST	$ WL SHARE	WET ACRES	UPLAND ACRES	ft. fence	ac. cover plantings	Ft. Shrub Plantings	ft. pipe lines	no. ponds	ac. grazing mgt.	ac. upland mgt.	ac. wetland mgt.
18 Contracts	460.0 ac.											
2000-Planned	258,901	4,847	5	18.9	3080		1267	1400		23.9	18.9	5
2000-Applied	NA	1935	NA	NA	878		0	1361		0	0	5.2
1 with wildlife												
16 Contracts	597.9 ac.											
2001-Planned	262,577	8411	4.7	6.7	1700	6.7			1	11.4	6.7	4.7
2001-Applied	NA	3503	NA	NA		5			1		5.0	
2 with wildlife												
17 Contracts	537.4 ac.											
2002-Planned	517,622	7472	.2	7		14.5	700	700	1		14.5	.2
2002-Applied	NA		NA	NA								
2 with wildlife												
12 Contracts	546.0 ac.											
2003-Planned	200,156	19,065										
2003-Applied	NA		NA	NA								
3 with wildlife												
WHIP Contracts												
12 Contracts	133.5 ac											
12 Planned		37,975	4.0	129.8	5390	70.8	9600	1907	3	133.8	121.2	6.5
7 Applied	NA	24,220	6.8	87	4814	51.8	6082	1849	4	93.8	78.4	7.3
5 cancelled												
BASIN CONTRACTS												
35 Contracts	868.7 ac.											
All-Planned	710,404	0										
All-Applied	NA	0	NA	NA								
0 with wildlife												

D. Cumulative Net Impacts (Acres/values by species gain/loss from table)

In 1999, due to increased workloads and a 75% reduction in staff, we chose to track cost-share, acres and wildlife practices for EQIP salinity. A statistical analysis of HEP data (collected through 1998) was conducted to determine adequate sample size needed to calculate mean habitat suitability indices (HSI) with 95% confidence. The calculated mean is within + or - .1 of the real mean. Data from 1999 and 2001 was also collected, desired sample sizes were achieved, and mean HSI values calculated for each wildlife species (for contracts with and without wildlife practices). Habitat Unit Values (HUV's) were then calculated by multiplying HSI's by HUV's, to estimate project impacts. The following per acre results in table 6 were extrapolated from the statistical data.

Table 6

Species	Acres gain(loss)	HUV gain(loss)
Pheasant	(38.87)	(2,361.84)
Yellow Warbler	(4.50)	(51.85)
Mallard Breeding	(68.76)	(3,266.76)
Mallard Winter	7.20	96.22
Montane Vole	(12.59)	(685.98)
Wren	.80	23.15
Owl	(23.13)	(2131.80)
Snipe	(33.83)	(239.53)

These figures (except for Mallard Breeding) are somewhat consistent with losses/gains expected with program implementation and the HUV summary in Section III A. As stated previously in this report some of the figures are inflated because of encroachment of development. The pheasant and (it could be assumed) the mallard breeding losses reflect changes (either conversions or management) of primarily upland acres (perennial herbaceous, annual herbaceous, pasture and hay land and cropland). The yellow warbler figure reflects losses of willow habitat along ditch banks. Vole and snipe figure reflects losses of palustrine emergent wetlands within over-irrigated pastures and changes in management. The owl figure reflects the loss of several stands of mature cottonwoods but, more importantly, the loss of diversity (ditch bank cover, fencerow cover) surrounding existing stands of cottonwoods.

IV. Discussion of Results

A. Problems/Issues

1. Procedures: Landowners' attitudes, smaller operating units and extensive development potential of rural properties have continued to limit our ability to achieve high quality, voluntary replacement. Wildlife practices in many of the older contracts had been deleted due to lack of interest on the part of the landowner. The Wildlife Habitat Incentives Program (WHIP) had also eliminated some good opportunities initially. However, we have begun to report results from WHIP projects within the priority area in this document.

Currently, urban sprawl is substantially decreasing both quantity and quality of upland and wetland habitats and wildlife populations.

Cumulative impacts from NRCS salinity activities on agricultural land have had little affect on wildlife populations. In some instances the quality of habitat has increased where marginal cropland has become more productive under new irrigation systems and better management. The boom in west slope population growth has undermined many of the positive aspects of the program. Achievement of any type of major habitat improvement will probably require going outside the bounds of the salinity area and working with individuals with wildlife as their priority. This should eliminate working with landowners whose priority is improving their irrigation system and "think" they want to improve habitat, but change their minds later.

We have also begun to evaluate program applications based upon the criteria of a specific resource. This way we are not including wildlife practices to just increase the funding opportunity for an irrigation project (though we may develop improved irrigation in order to enhance wildlife habitat).

2. Assessment/Evaluation: With the current staffing levels and workload, the types of monitoring and evaluating procedures we are utilizing work well. It would be impossible to monitor and track changes to habitat on every land unit we are working on. This difficulty would be compounded by the continued encroachment of development which would somehow need to be extrapolated out of the assessment results.

B. Progress With Replacement: Voluntary replacement efforts have basically met the expectation for the area. The established, long-term inhabitants have never been too enthusiastic about improving or developing wildlife habitat. One would have expected the large influx of new people to the region to have changed this outlook. However, it appears money is more of a motivating factor then wildlife resources. This is evident by the speculation in new subdivisions and housing units going in throughout the county. Within the boundary of the project area the average size of a "farm" is down to less than 40 acres. The one resource an individual is willing to improve upon is the water resource which, of course, positively affects land values. For that reason replacing wetland for wetland is not a popular issue.

For the most part NRCS impacts to habitat have been minor compared to the impacts of development and other activities over the past 12 years. We have lost some of our best habitat improvement opportunities due to encroachment of development in close proximity with potential projects during this time. Our greatest gains have been with a small number of landowners whose main interest is preserving the natural landscape and improving upon their water resources for wildlife and wetland development/enhancement. These properties are more substantial in size than the average wildlife project area.

V. Conclusion

The future potential for habitat development/improvement within the project area is limited. The fact that water shortages are now perceived as "real" will continue to hurt our efforts for achieving wetland replacement. Water resources are now becoming a more valuable commodity. This will lead to more projects which "save" water from evaporation and deep percolation which will, in turn, reduce the amount of seepage-induced wetlands. Upland cover types will continue to be impacted by the encroachment of development, which we have no control over.

In order to continue to attempt to replace habitat lost, we will need to start looking off-site for possibilities. This can be accomplished by working with interested landowners in watersheds within the same geographic region and having similar cover types. More importantly, we could be working with landowners who have important habitat under their control.

Monitoring and assessment efforts are still going to be influenced by staffing constraints and evaluation methods. Placing a value on a particular cover type is very subjective on the small acreage land units we are working with. HEP was developed to evaluate large projects which could be monitored over time with little outside influence.